Course BCA-09
Database Management Systems

Unit 1: File Structure
What is data and information, Concept of field, key field; Records and its types, fixed length records and variable length records; Files, operation on files, Primary file organization.

Unit 2: Database System
Traditional file approach vs. Database approach, Database Management System (DBMS), merits and demerits of DBMS, Database architecture, Data independence, Types of DBMS, Database Administrator

Unit 3: Data Models
Conceptual model, logical model, physical model, ER model as a tool for conceptual design: entities, attributes and relationships, weak and strong entities, conversion of ER model into relational schema, ER modeling symbols.

Unit 4: The Relational Model
Relational data model concepts, Integrity constraints: Entity integrity, Referential integrity, Domain Constraints.

Unit 5: Keys
Concept of keys, Composite key, Candidate key, Primary key, Alternate key, Foreign key, Defining primary and Foreign keys in database.

Unit 6: Relational Database Design
Database design, Decomposition, Universal Relation, Functional dependencies, Prime and Non-prime attribute

Unit 7: Normalization
Normalization, First Normal form(1NF), Second Normal form(2NF), Third Normal form(3NF), Boyce-Codd Normal form(BCNF), Fourth Normal Form(4NF), Fifth Normal form(5NF)

Unit 8: Introduction to SQL
Structured Query Language(SQL), Characteristics of SQL, Advantages of SQL, SQL data types, Types of SQL commands DDL, DML, SQL commands : Select .. From… Where… Group by ….. Having… Order by…, Tables, Views and Indexes, Queries, Sub Queries, Insert, Update and Delete operations, Constraints considers (NOT NULL , UNIQUE, Check Primary key, Foreign key)

Unit 9: Database recovery and Security
Concept of database recovery, Backup of database, Types of database failure, Types of database recovery, Goals of database security.

Suggested readings:

1. "Database Systems: Concepts, Design and Applications", by S.k. Singth, Pearson Edition
2. "Introduction to Database Management Systems", by Atul Kahate, Pearson Edition
3. "Fundamentals of Database System", by Elmasri Navathe, Somayajulu & Gupta, Pearson Education publication.